

Planning Alternative Corridors for Transmission Lines (PACT):

A Web-based Decision-Support Tool for Comparing Transmission Line Corridors

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PIER Mission

- **PIER:** supports Energy research, development and demonstration projects that help improve the quality of life in CA by bringing environmentally safe, affordable, and reliable services and products to the marketplace.
- **PIER - Environmental Area:** develop cost-effective approaches to evaluating and resolving environmental effects of energy production, delivery, and use in CA, and explore how new energy applications and products can solve environmental problems.

Transmission Projects Face Public Challenges and Process Requirements

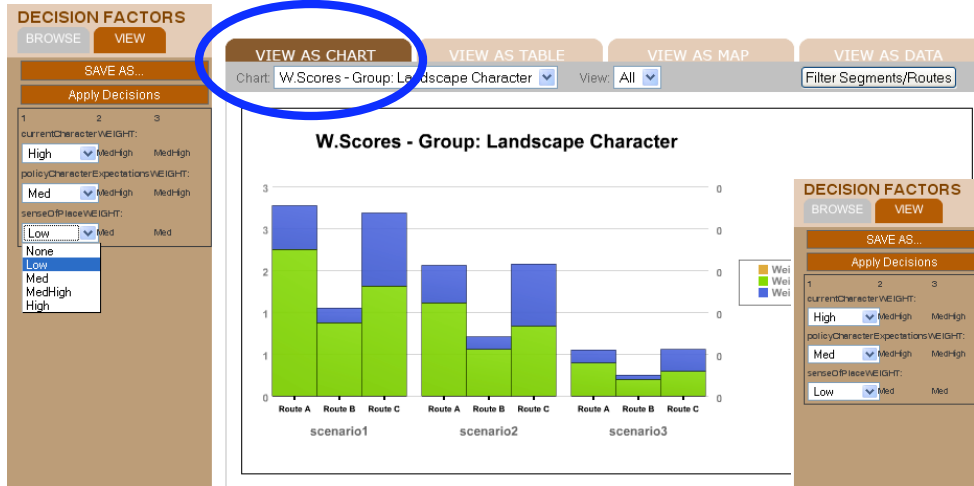
- Siting new high voltage lines - Typical timeframe required from concept to completion is 5 -7 years
- Technical issues are multidisciplinary
- Different stakeholders have different values
- Involving stakeholders early in the planning process considered key to successful siting projects
- Need method to communicate technical issues and values

Purpose of PACT

- Three year project to develop a web-based tool to present an analysis of alternative routes on the basis of environmental and engineering attributes
- Corridor analysis that ID's best options from point to point
- Outcome based on objective, comprehensive, consistent, and transparent analysis
- Provide framework for stakeholders to understand the impacts & tradeoffs of alternative routes

Stakeholders Have Access to Information

- Shows calculation methods, grading, source data and definitions.

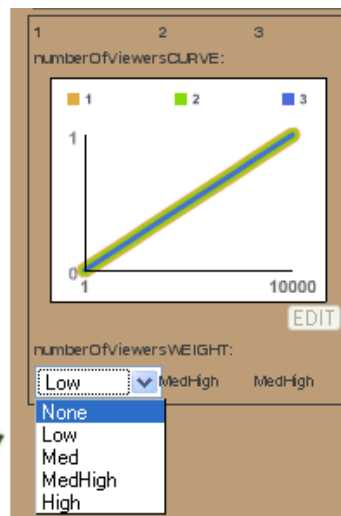


VIEW AS CHART VIEW AS TABLE VIEW AS MAP VIEW AS DATA

Table: Measure-Group: Landscape Character View: All Filter Segments/Routes

Measure-Group: Landscape Character

| | scenario1 | | | scenario2 | | | scenario3 | | |
|-----------|------------------------------------|--------------------------------------|---------------------------------|------------------------------------|--------------------------------------|---------------------------------|------------------------------------|--------------------------------------|---------------------------------|
| | Default Scenario using 'scenario1' | | | Default Scenario using 'scenario2' | | | Default Scenario using 'scenario3' | | |
| segmentID | Measure: Current Character (Grade) | Measure: Policy Expectations (Grade) | Measure: Sense Of Place (Grade) | Measure: Current Character (Grade) | Measure: Policy Expectations (Grade) | Measure: Sense Of Place (Grade) | Measure: Current Character (Grade) | Measure: Policy Expectations (Grade) | Measure: Sense Of Place (Grade) |
| Route A | 0 | 5.00 | 3.00 | 0 | 5.00 | 3.00 | 0 | 5.00 | 3.00 |
| Route B | 0 | 3.00 | 1.00 | 0 | 3.00 | 1.00 | 0 | 3.00 | 1.00 |
| Route C | 0 | 4.00 | 5.00 | 0 | 4.00 | 5.00 | 0 | 4.00 | 5.00 |
| Total | | 12.00 | 9.00 | | 12.00 | 9.00 | | 12.00 | 9.00 |



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Biological Resources > Low Biological Value

Intersection of the transmission lines with land that has been disturbed in the past and has low biological value.

VIEW AS CHART VIEW AS TABLE VIEW AS MAP VIEW AS DATA

Indicator List

- Low Biological Value
 - Description: Intersection of the transmission lines with land that has been disturbed in the past and has low biological value.
 - Goal: Build transmission lines where biological values have been lowered due to other types of development.
 - Description: This Decision Factor identifies area where the natural conditions and processes have been impacted by development (e.g. facilities, roads, mines, dams, abandoned campgrounds) and/or by agricultural practices (e.g. farming, grazing, timber harvest, abandoned irrigation ditches). [National Park Service, U.S. Department of the Interior 2003]
 - Data Types: Expert Judgment
 - References: National Park Service 2003. Disturbed Land Restoration.
 - Method: Biological benefits are handled as mitigation effects if transmission line construction will improve long-term Biological Values (e.g.: by improving native ecosystems).
 - Grade Method: 1 No degradation - the area has had no impacts from development activities.

Environmental Assessment and Communication Tool

- Educates public and decision makers on technical merits and facilitates understanding of the tradeoffs between proposed alternatives – defensible results
- Allows scenarios that represent values of different stakeholders
- Allows analysis at varying detail -from planning to permitting
- Can be used on any footprint (linear corridor or single site)

Potential Users of PACT

- Utility project planners
- Transmission line regulators
- Environmental review teams
- Public and stakeholder groups
- Decision makers

PACT Development Based on Broad Participation

- **Project Management Team**
 - CEC: PIER and Siting Division
 - Administrator: Aspen Environmental Group
 - Model Development Contractors: SCE, Facet Decision Systems
- **Project Steering Committee (PSC)**
 - Guide the research and review deliverables
 - Regulators, utilities, resource and land planning agencies, community groups
- **Technical Advisory Groups (TAGs)**
 - Subject matter experts suggest and evaluate criteria in technical modules
 - Specialists in engineering, land use, biology, cultural resources, aesthetics, and community interests

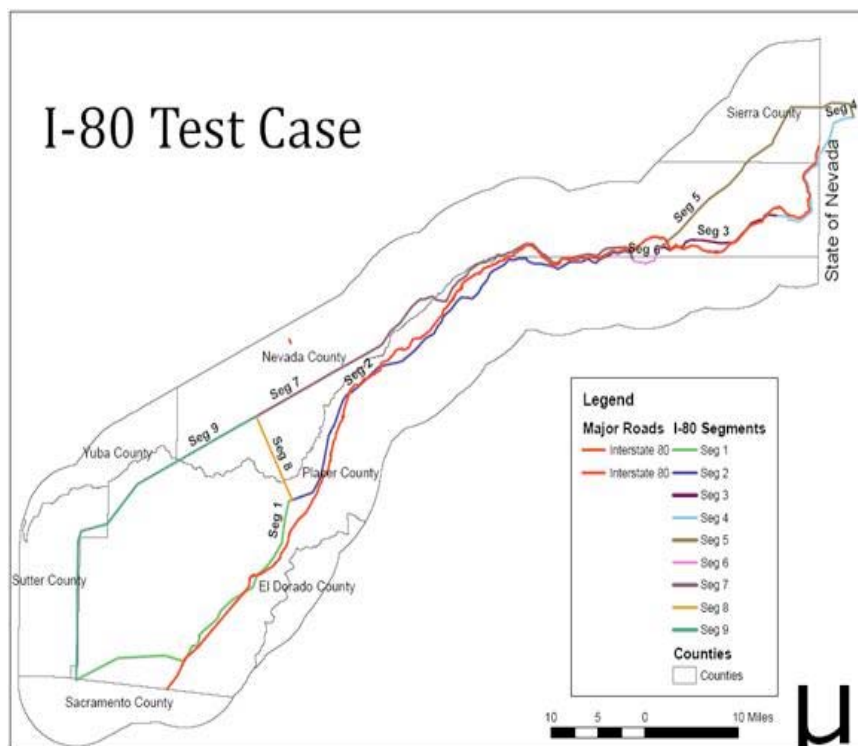
Project Steering Committee

- CHAIR: CEC-Siting Division
- ISO
- CPUC
- LADWP
- PG&E
- SDGE
- SF PUC
- SCE
- SMUD
- Western Area Power Administration
- US BLM
- USDA Forest Service
- CA Farm Bureau Federation
- Dept of Defense – US Navy
- CA Institute for Energy & Env
- Energy Policy Initiatives Center (UCSD)
- League of Cities
- League of Women Voters
- Native American Heritage Commission
- SF Bay Conservation & Development Commission
- So. CA Assn. of Governments
- North American Electricity Reliability Corp
- Regional Council of Rural Counties

Technical Advisory Groups

- Provided initial input on factors and data sources
- Reviewed factor definitions, scoring, grades
- Previewed and provided feedback on web site functionality
- A subset of each TAG is performing tests – using factors and website to evaluate alternative routes

Test Cases Used to Test Model



- **Delta Project - template**
 - Used data on project but changed name
 - Data incomplete
- **Solano Project - function**
 - Obtained GIS data from Solano County
 - Data Incomplete
- **I-80 Corridor – technical validity**
 - Sierra, Nevada, Placer, Sacramento Counties

Next Steps

- Fine tuning – functionality, display, etc.
- Apply TAG test results and grading
- Complete training manual and on-line tutorial
- Project Steering Committee Meeting – June 26
 - Gain Approval
 - Determine Host
- Training sessions – July/Aug
 - Technical
 - GIS
- Public Workshop
- Complete Project – October/Nov 2008

- **VALIDATION**

Upfront Decision and Data Needs

- What are the alternatives, what are the spatial features (size, shape, interconnections)
 - Must be digitized electronically
- Assemble GIS data sources in appropriate format – load data
- Assure there is metadata describing the attributes of the GIS data
 - How recent? How much coverage? What more needed?
- Identify or select specific evaluation criteria
 - How they will be measured? How important to decision (weights)?
- ID any features that cannot be mapped, measure and determine how will add to spatial alternatives (tower heights, EMF)
- ID constraints that would eliminate alternative segments
- Determine who will apply criteria to alternative segments
- Who will perform analysis – training
- PACT does not perform analysis – is a tool that compiles data into segments and allows comparison and display in illustrative format.